

POLYMOBIL Plus

SP

Maintenance Instructions

System

POLYMOBIL Plus

The protocol SPR8-125.832.01.02.02 is required for these instructions

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Document revision level

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1 General

1.1 Required documentation

• Maintenance Protocol	SPR8-125.832...
• Service Instructions	SPR8-125.061...
• Instructions for Use	SPR8-125.201...
• Block Circuit Diagram	X069I
• Function Description	SPR8-125.041...
• Technical Safety Checks - Protocol *	SP00-000.834.01...

* According to DIN VDE 0751-1, we recommend documenting the maintenance results in the maintenance protocol as well as the TSC protocol, completing it fully and handing it over to the customer.

1.2 Required tools, measurement and auxiliary equipment

NOTE

All tools, measurement and auxiliary devices, with the exception of those marked "*", are listed in the STC (Service Tools Catalogue) along with their specifications.

- | |
|---|
| • Standard service tools * |
| • 2-channel memory oscilloscope |
| • Protective conductor and device leakage current meter |
| • Torque wrench 20 Nm - 100 Nm |
| • Loctite 242 |
| • Dose meter (for optional "DAP measuring system" only) |
| • Calibration tool for "DAP measuring system", part no. 65 84 978 |

1.3 Required lubricant

• All purpose spray WD-40		28 70 061
• Optimol Longtime PD2 grease	(20 g)	34 91 271
	(1 kg)	73 95 445

1.4 Text emphasis




 DANGER	DANGER indicates when there is an immediate danger that l e a d s to death or serious physical injury.
 WARNING	WARNING indicates a risk of danger that m a y l e a d to death or serious physical injury.
 CAUTION	CAUTION used with the safety alert symbol indicates a risk of danger that leads to slight or moderate physical injury and/ or damage to property.
NOTICE	NOTICE used without the safety alert symbol indicates a risk of danger that if disregarded leads or may lead to a potential situation which may result in an undesirable result or state other than death, physical injury or property damage.

Fig. 1: Safety notes

1.5 Safety information and protective measures



Risk of death, injuries or material damage

Non-compliance can lead to death, injuries or material damage.

Please observe:

- ⇒ the product-specific safety information in these instructions
- ⇒ the general safety information in the document TD00-000.860.01... and
- ⇒ the safety information according to ARTD part 2.



X-ray radiation!

Non-compliance can lead to illness, irreversible damage to body cells and genetic material, severe injuries and death.

When working on the unit which requires release of radiation, the radiation protection guidelines and the radiation protection rules according to ARTD-002.731.02... must be observed.

Observe the following:

- ⇒ Use available radiation protection equipment.
- ⇒ Wear radiation protective clothing (lead apron).
- ⇒ Keep distance to radiation source as large as possible.
- ⇒ Only release radiation if necessary.
- ⇒ Set radiation as low as possible (low kV and mAs values).
- ⇒ Release radiation as briefly as possible.
- ⇒ Checks that require radiation to be released are marked by the radiation warning symbol displayed on the left.



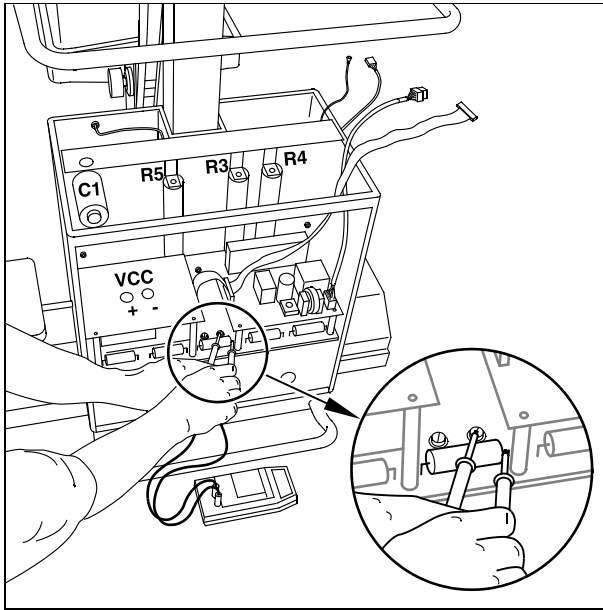


Fig. 2:



**When working on the open unit there is a risk of electrical shock!
Non-compliance can lead to injuries or death.**

Observe the following:

- ⇒ The capacitor bank can still be charged. Do not attempt to work on the system while this condition exists.
- ⇒ After switching off the system, approximately 450 VDC (350 VDC for Serial No. < 10100) may still be present in the system even after disconnecting the line voltage plug. Within 10 minutes this voltage will drop to approximately 10 V.
- ⇒ Always measure the actual voltage present with the DVM at test points -VCC and + VCC on the D 960 inverter board or (more accessible) on the D 970 capacitor board at the + connection point of capacitor C3 and on the right side of fuse F3 (Fig. 2 / p. 9).
- ⇒ LEDs V1 ... V10 on D 970 go out at a significantly higher voltage level and are therefore not reliable safety indicators.
- ⇒ If a fuse on the D 970 has responded, high voltage may still be present at the affected capacitor even after a prolonged period of time.
- ⇒ The capacitor discharge circuit utilizes the D925 board, CS and LS relays. If connectors X3 or X9 on D 925 or D 950 are not inserted or if there is a defect in the circuit, the C-bank will not discharge. This can cause life-threatening voltage to be present in the system even after a prolonged period of time.
- ⇒ Also refer to the Polymobil Plus Service instructions SPR8-125.061... "Replacing the capacitor bank".

- Connect the Polymobil Plus only to a line voltage supply (line voltage receptacle) that complies with the requirements of VDE 0107 or corresponds to the local national regulations.
- Disconnect the Polymobil Plus at the line voltage **OFF** switch on the operating console and disconnect the **line voltage plug** prior to performing any service work.
- Remove or insert boards with the generator switched OFF only; observe ESD guidelines when handling boards.

1.6 Explanation of abbreviations

Abbrev.	Explanation
SI	Safety Inspection
SIE	Electrical Safety Inspection
SIM	Mechanical Safety Inspection
PM	Preventive Maintenance
PMP	Preventive Maintenance Preventive Parts Replacement, External Inspection, etc.
PMA	Preventive Maintenance Adjustments
PMF	Preventive Maintenance, Function Check, Operating Value Check
Q	Quality Check
QIQ	Image Quality Check
QSQ	System Quality Check
SW	Software Maintenance

The items identified by these abbreviations are contained in the Maintenance Protocol and should be checked off upon completion.

1.7 Information on the protective conductor resistance test

Observe the information in the "Safety rules for installation and maintenance" (ARTD-002.731.17...).

The protective conductor resistance is to be measured, documented and evaluated during maintenance.

NOTE

For evaluation, the value first measured and values documented during previous maintenance or safety checks are to be compared to the measured values. A sudden increase of the measured values, even if the limit value of 0.2 Ohm is not exceeded, indicates errors in the protective conductor connection (protective conductor or contacts).

Measurement is to be carried out according to DIN VDE 0751, part 1 (see ARTD part 2). In doing so, the protective conductor resistance to all conductive and accessible parts is to be measured in the normal operating status of the unit.

Make sure that control or data cables between components of the unit do not simulate a protective conductor connection.

During measurement, the power supply cable and additional connection cables with integrated protective conductor are to be moved section by section in order to detect breaks in the cables.

The protective conductor resistance must not exceed 0.2 Ohm.

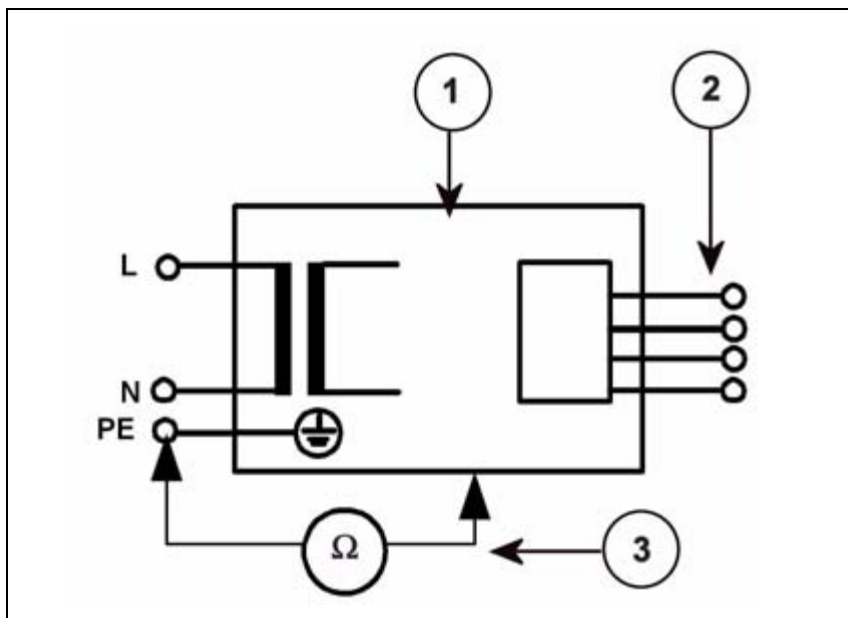


Fig. 3: *Measuring circuit for measuring the protective conductor resistance for units that are disconnected from power, in compliance with DIN VDE 0751-1/2001-10, Fig. C2.*

- Pos. 1 = System
- Pos. 2 = Application part type B (if available)
- Pos. 3 = Measurement setup (integrated into measuring device)

The values that were determined are to be logged and evaluated in the report “Protective conductor resistance / report” by indicating the measuring points.

In addition, the measuring procedure and the measuring device used (designation and serial number) are to be documented.

NOTE

The report “Protective conductor resistance / report” is filed in the “Certificates” register in the system folder.

NOTE

If documentation of protective conductor resistance measurements is missing, a new report must be created.

A new report “Protective conductor resistance / report” is included in the SPR8-125.034.02.02 startup instructions. Detach this report from these instructions, complete it and file it in the “Certificates” register in the system folder. For a first determination, the determined values are to be logged as values measured for the first time. Evaluation is not required in this case.

1.8 Information on the device leakage current measurement

NOTE

During maintenance, the device leakage current measurement is to be carried out and logged as repeated measurement.

However, under the following circumstances the value first measured is to be determined again and a new report is to be created:

- If documentation of device leakage current measurement is missing.

- If local mains voltage deviates from the mains voltage documented in the report (e.g. in case of change of location / change of operator).

- When using another measuring process for measuring the device leakage current than that documented in the report.

For traceability, the newly created report is to be referenced in writing on the old report. The reason for new determination of the value which was first measured is to be documented and confirmed with name and signature.

Observe the instructions in the “Safety rules for installation and maintenance” (ARTD-002.731.17...).

⚠ WARNING

Electrical voltage!

Non-compliance can lead to severe injuries even resulting in death.

⇒ **The device leakage current measurement for devices of protection class I may only be carried out after protective conductor tests were carried out successfully.**

First measured value

The first measured value was determined already and documented in the report “Device leakage current / report”. The measuring method was also logged.

Measurement was carried out with the logged mains voltage and the logged measuring devices.

Measurement

Measurement is to be carried out according to DIN VDE 0751, part 1 (see ARTD-002.731.17...) and the determined value is to be logged.

The measuring method indicated in the report is to be used for this.

If the value first measured needs to be determined again (see instructions above), either direct measurement or differential measurement can be selected.

Measuring the device leakage current according to the differential current method (measuring setup according to (Fig. 4 / p. 15)) is the preferred method, as the person carrying out the measurement or other persons are not endangered during the measurement.

However, observe the minimum resolution of the leakage current measuring device and additional manufacturer specifications which limit usage of the measuring device.

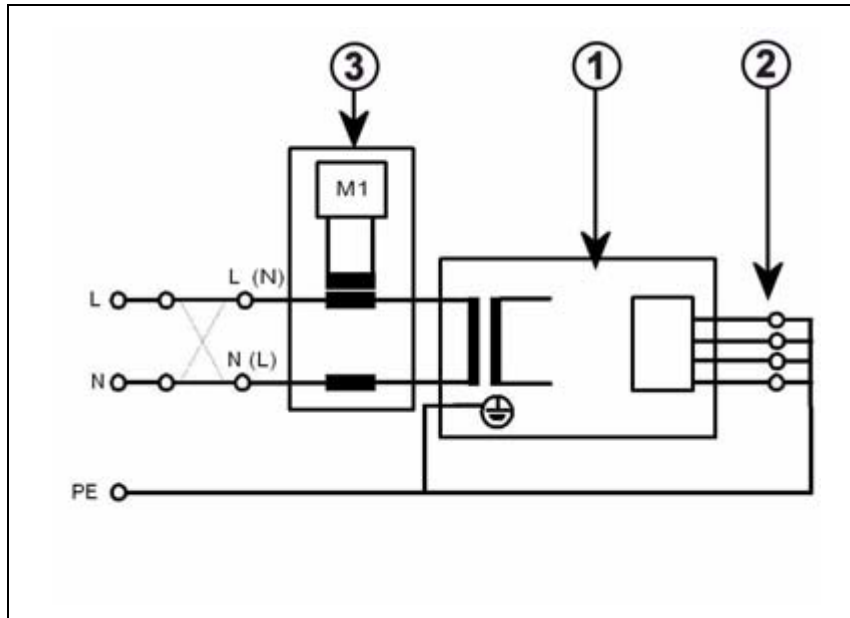


Fig. 4: Measuring circuit for measuring the leakage current according to the differential current method in compliance with DIN VDE 0751-1/2001-10, Fig. C6 for protection class I.

- Pos. 1 = System
- Pos. 2 = Application part type B (if available)
- Pos. 3 = Measurement setup (integrated into measuring device)

If direct measurement of the device leakage current is used (measuring setup according to (Fig. 5 / p. 16)), the system must be installed in an insulated way and must not be touched during measurement.

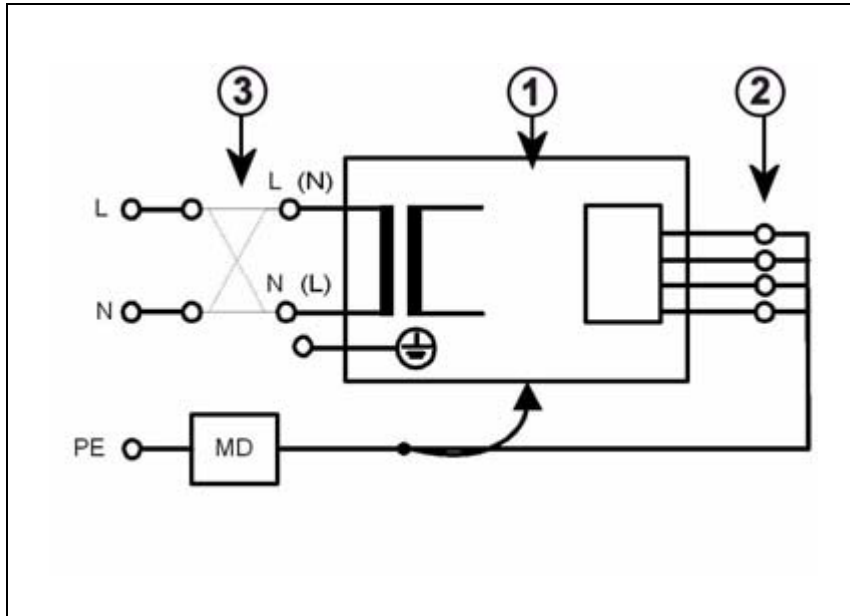


Fig. 5: Measuring circuit for direct measurement of the leakage current in compliance with DIN VDE 0751-1/2001-10, Fig. C5 for protection class I.

- Pos. 1 = System
 Pos. 2 = Application part type B (if available)
 Pos. 3 = Measurement setup (integrated into measuring device)

WARNING

Electrical voltage!

Non-compliance can lead to serious injuries or even death.

- ⇒ **When measuring device leakage current directly, during measurement, no housing parts of the unit must be touched (Fig. 5 / p. 16).**
- ⇒ **Access to the unit by third parties must be prevented.**

The unit must be switched on during measurement. Therefore, measuring devices with automated measuring procedure must be set to manual measuring.

The highest value must be entered into the report "Device leakage current / report".

This value must not exceed the permissible leakage current values according to DIN VDE 0751-1/2001-10, Table F.1, line "Device leakage current for units according to remarks 1 and 3", of 2.5 mA.

The actual mains voltage is to be measured and logged. If the measured mains voltage deviates from the nominal voltage, the measuring value is to be corrected to the value which corresponds to a measurement with the nominal value of the mains voltage. This is to be additionally documented.

The measuring method (differential measurement or direct measurement) and the measuring device used (designation and serial number) are to be documented.

For repeated measurements, the measuring value is to be evaluated additionally.

NOTE

For evaluation, the value first measured and the values documented during previous maintenance or safety tests are to be compared with the measured values. A sudden increase of the measured values, even if the limit value of 2.5 mA is not exceeded, indicates errors in the primary circuit of the mains voltage supply (insulation damages, damages due to dampness, faulty suppressor element or similar).

In case of new determination, evaluation is not required.

The report "Device leakage current / report" is to be filed in the "Certificates" register in the system folder.

NOTE

The report "Device leakage current / report" is filed in the "Certificates" register in the system folder.

NOTE

If documentation of device leakage current measurement is missing, a new report must be created.

A new report "Device leakage current / report" is included in the startup instructions SPR8-125.034.02.02. Detach the report from this instruction, complete it and file it in the "Certificates" register in the system folder. For a first determination, the determined values are to be logged as values measured for the first time. Evaluation is not required in this case.

1.9 Technical Safety Checks (TSC)

Abbreviation: TSC = Technical Safety Checks

NOTE

Within the scope of DIN VDE 0751-1, the operator of medical-technical products is required to carry out technical safety checks at regular intervals.

The tests listed in these maintenance instructions include all technical safety checks required according to DIN VDE 0751-1.

For the technical safety checks, a separate report is available with the print number SP00-000.834.01....

Within the scope of DIN VDE 0751-1, we recommend documenting the results of maintenance in the maintenance protocol as well as the TSC protocol, completing it and handing it over to the customer.

The following table allocates the corresponding maintenance procedures to each technical safety check which is documented in the document SP00-000.834.01....

Test certificate "Technical safety checks"	Maintenance instructions, test / remarks
1 Information for identification	Please complete fields.
2 General tests	n.a.
2.1 Visual check: No damages affecting safety?	2.1.1 Checks for signs of damage, tests: SIM Covers SIM Control box / control console SIM Exposure release cable SIM Power and primary cables
2.2 Cables and cable guides safe and without visible damage?	2.1.1 Checks for signs of damage, tests: SIM Exposure release cable SIM Power and primary cables
2.3 Used accessories without damage?	2.1.1 Checks for signs of damage, test: SIM DAP measuring system (optional)
2.4 Radiation protection equipment available and without damage? (no structural radiation protection)	2.9 Radiation, tests: SIE Radiation indicator SIE Acoustic signal

Test certificate “Technical safety checks”	Maintenance instructions, test / remarks
2.5 Required operator documents complete, available, readable	2.1.3 Customer documents, test: SI customer documents Ask the customer for additional required operator documents and check for completeness, availability and readability.
2.6 All warnings available and visible?	2.1.2 Labels, test: SIM labels
2.7 Operating icons, LEDs and key labeling ok?	2.9 Radiation, test: SIE Radiation Indicator 2.10 Control console, tests: SIE Operating elements SIE Indicators
3. Electrical checks	n.a.
3.1 Protective conductor resistance measurement	2.11 Protective conductor test, test: SIE Protective conductor test
3.2 Device leakage current or equivalent device leakage current measurement	n.a.
3.2.1 Device leakage current measurement	2.12 Device leakage current measurement, test: SIE Device leakage current measurement
3.2.2 Equivalent device leakage current measurement	n.a.
3.3 Patient leakage current or equivalent patient leakage current measurement	n.a.
3.3.1 Patient leakage current measurement	n.a.
3.3.2 Equivalent patient leakage current measurement	n.a.
4. Mechanical checks	n.a.
4.1 Wall, ceiling and floor attachments fixed and without damage?	n.a.

Test certificate “Technical safety checks”	Maintenance instructions, test / remarks
4.2 Mechanically moving unit parts clean and easy to move (lubricated, if necessary)?	2.8 Stand, test: SIM Support arm locking device 2.6 Single tank, test: SIM Locking device 2.7 Double-slot diaphragm, test: SIM Rotating
4.3 Ropes, chains, belts and spindles without signs of wear and tear?	2.8 Stand, test: SIM Chains of the spring counterbalance
4.4 Mobile devices: wheels / pulleys and brakes ok?	2.2 Checking the screws, test: SIM Front wheels 2.4 Checking the wheels, tests: SIM Noises SIM Ease of movement SIM Wear and tear on the rubber cover 2.5 Checking the pedal positions, test: SIM Braking / locking
4.5 No conspicuous sound during operation (e.g., gear)?	2.4 Checking the wheels, test: SIM Noises 2.8 Stand, test: SIM Spring counterbalance
5. Functional checks	n.a.
5.1 Emergency Stop- emergency shut-down button functional	n.a.
5.2 Warning devices functional?	2.9 Radiation, tests: SIE Radiation indicator SIE Acoustic signal
5.3. Switch-off of unit movements in end position OK?	n.a.
5.4 Switch-off of unit movements via collision protection OK (e.g., collision protection)?	n.a.
5.5. Safety distances (wall, floor, ceiling) complied with or ensured via other measures (e.g., light barrier)?	n.a.
5.6. Other safety shutoffs functional (e.g., safety floor plate)?	n.a.

Test certificate “Technical safety checks”	Maintenance instructions, test / remarks
5.7 Table and unit positions reproducible (e.g., zero positions, layer height etc.)?	n.a.
6. Product-specific tests	<p>2.2 Checking the screws, tests: SIM Cassette compartment SIM Pedals</p> <p>2.3 Checking the handles, tests: SIM Single-tank yoke SIM Single tank SIM Transport handle above the control console</p> <p>2.5 Checking the pedal positions, tests: SIM Maneuvering movement SIM Forward movement</p> <p>2.6 Single tank, test: SIM Suspension</p> <p>2.8 Stand, test: SIM Stand mounting</p> <p>2.13 DAP measuring system (optional), test: SIE Function of DAP measuring system</p>
7. Test result / evaluation:	<p>Evaluate the long-term tendencies of the protective conductor resistance and the device leakage current by comparing the actual measuring values with the values determined during previous safety-relevant tests. A sudden increase of the measured values, even if the limit values are not exceeded, indicates a safety-relevant fault.</p> <p>Enter the result of the test.</p> <p>Have the TSC protocol signed by the operator or a person authorized by the operator.</p> <p>Hand over the TSC protocol to the operator or a person authorized by the operator.</p>

2 Inspection and Maintenance

2.1 Visual inspection

2.1.1 Checking for signs of damage

- Repair or replace damaged parts as required.

SIM Covers

SIM Control box / control console

SIM Exposure release cable

SIM Power and primary cables

- Check the cables for damage and breakage. Pay special attention to the cable run at the bends of the flexible hose.
 - At locations where the cables are subjected to severe strain due to movement, check to ensure that the holding device is firmly seated.

SIM DAP measuring system (optional)

- Make sure there are no scratches on the DAP ionization chamber. Make sure the cable and the connector are intact. Make sure the DAP display is intact as well.

2.1.2 Labels

SIM Labels

- Check all labels on the device with model and serial number, as well as warnings. Positioning of the labels is described in the operator manual (chapter "Location of labels").
- Make sure all labels are available and readable.

2.1.3 Customer documents

SI Customer documents

- The operator manual must be available to the customer.
The operator manual must be checked for availability, completeness and readability.

2.2 Checking the screws

- Check for firm seating and tighten, if necessary:

SIM **Cassette compartment**

SIM **Pedals**

SIM **Front wheels**

2.3 Checking the handles

- Check the handles for firm seating and tighten, if necessary:

SIM **Single-tank yoke**

SIM **Single tank**

SIM **Transport handle above the control console**

NOTE

If any screws or locking elements are to be replaced, the matching screw-locking devices must also be replaced.

2.4 Checking the wheels

SIM **Noises**

SIM **Ease of movement**

SIM **Wear and tear on the rubber cover**

- Check the wheels for noises, ease of movement and wear and tear on the rubber cover; replace if necessary (see Service Instructions "Replacing the steering castor").

2.5 Checking the pedal positions

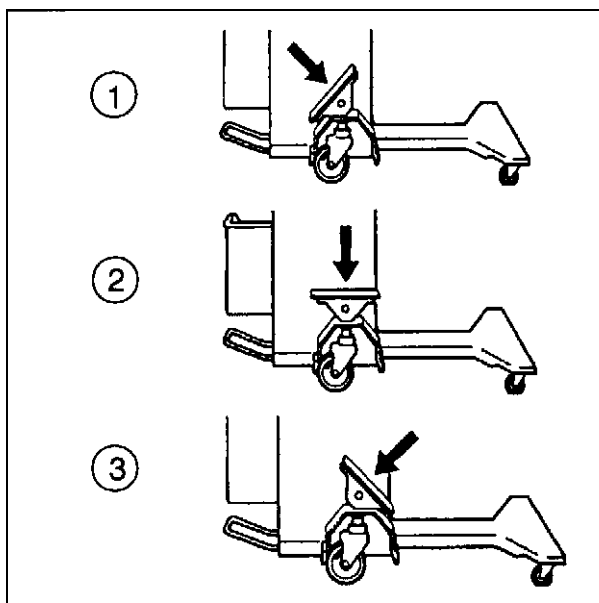


Fig. 1: Checking the pedal positions

- If the following functions are no longer reliable, replace both steering castors completely (see Service Instructions "Replacing the steering castor").

SIM Braking / Locking

- Pedal positions are as shown in (1//Fig. 1 / p. 26)
 - ⇒ The rear wheels are locked.
The unit is locked in place and cannot be moved.

SIM Maneuvering movement

- Pedal positions as shown in (2//Fig. 1 / p. 26)
 - ⇒ The rear wheels can be freely swiveled.
The unit can be moved in any desired direction.

SIM Forward movement

- Pedal positions as shown in (3//Fig. 1 / p. 26)
 - ⇒ The unit can be moved forwards and backwards.
It is steered by means of the front wheels.

2.6 Single tank

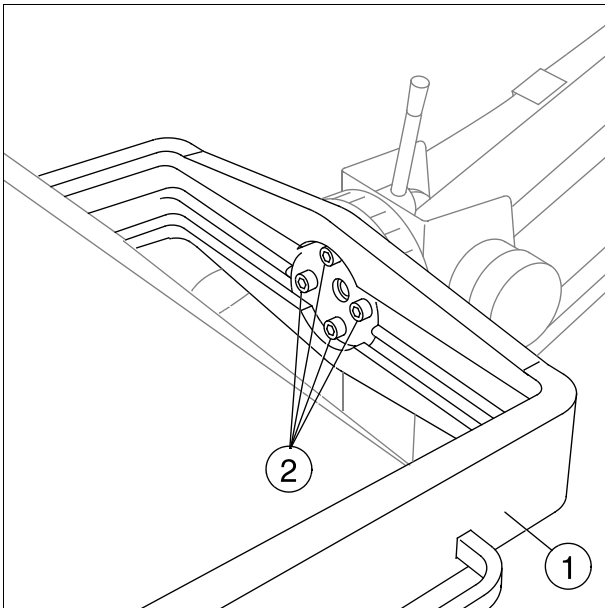


Fig. 2:

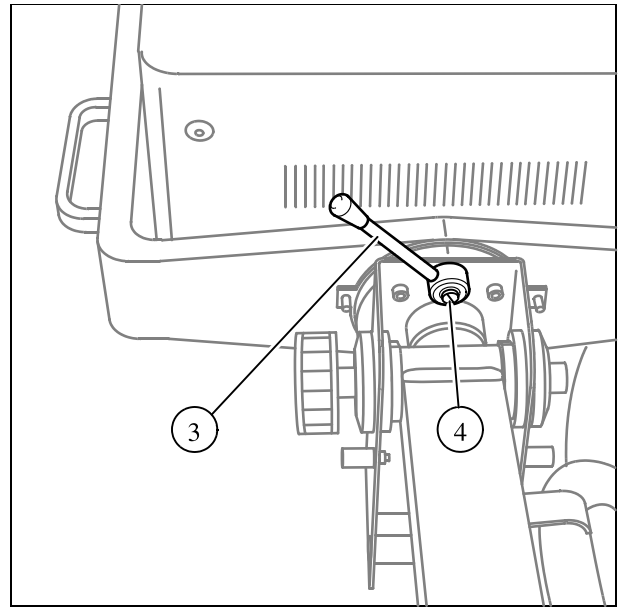


Fig. 3:

SIM Suspension



- The single tank support (1//Fig. 2 / p. 27) with the single tank must be seated securely on the flange of the support arm. Check the torque of the 4 screws (2//Fig. 2 / p. 27);
- NOM: 25 Nm, Tolerance: $\pm 10\%$.

SIM Locking device

- Check the locking handle (3//Fig. 3 / p. 27) for firm seating and tighten, if necessary.
- With the locking device released (locking handle (3//Fig. 3 / p. 27) set counterclockwise), it must be possible to move the single tank to all sides easily.
- Checking the locking device: Tighten the locking handle (3//Fig. 3 / p. 27) in clockwise direction. It should no longer be possible to shift the single tank.

Readjusting the locking device:

- Tighten the locking handle (3//Fig. 3 / p. 27) in clockwise direction up to the stop.
- Unscrew the screw (4//Fig. 3 / p. 27) and push the locking handle off the shaft using the screwdriver.
- Insert the locking handle in perpendicular position and tighten the screw (4//Fig. 3 / p. 27) securely.
- Recheck the locking mechanism of the single tank.

2.7 Double-slot diaphragm

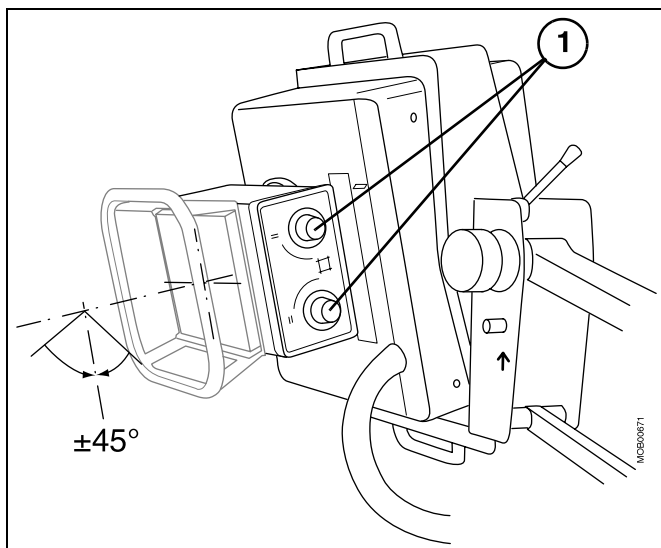


Fig. 4:

- Connect the line voltage cable and turn the Polymobil Plus **ON**.

PMF Light localizer lamp

- Check the function of the light localizer lamp and replace, if necessary. Refer to the Service Instructions "Replacing the light localizer lamp".

SIM Rotating

- Check whether the double-slot diaphragm can easily be rotated $\pm 45^\circ$ (Fig. 4 / p. 28).

PMF Format setting

- Check the format setting (pairs of collimator leaves) for ease of movement and uniformity (by sliding the diaphragm adjusting levers (1//Fig. 4 / p. 28)).
- Switch the Polymobil Plus **OFF** and disconnect the line voltage plug.

PMF 0° degree position

- Move the support arm into its uppermost position.
- Place a water level against the double-slot collimator and check the 0° setting.
If necessary, readjust the scale on both sides.

2.8 Stand

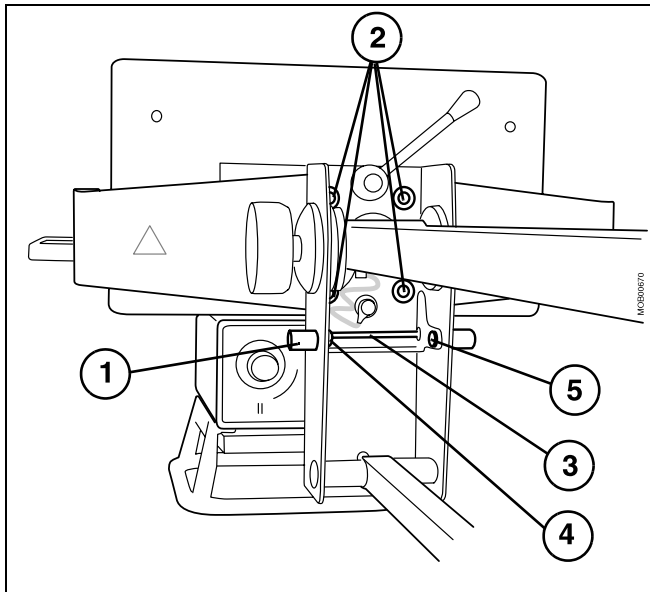


Fig. 5:

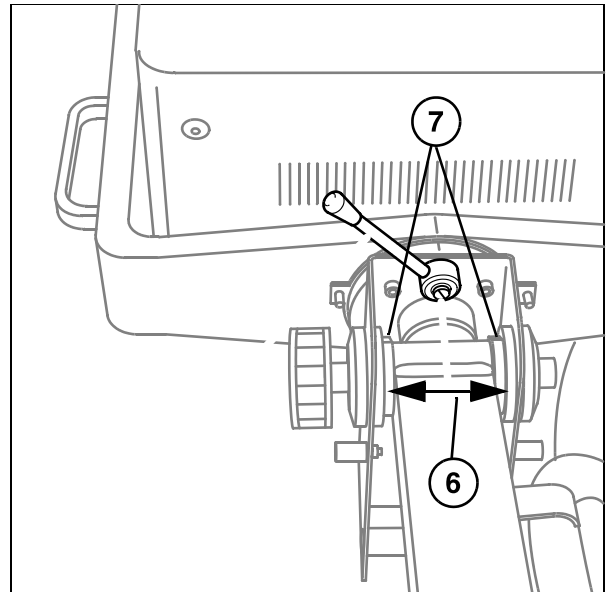


Fig. 6:

SIM Support arm locking device

- Move the support arm to the horizontal position after loosening the locking device (1//Fig. 5 / p. 29).
- Tighten the 4 Allen screws (2//Fig. 5 / p. 29) securely.
- Move the arm system into the lock-in position, making sure that the central stop bolt **audibly** snaps into the catch without any friction or jamming.
- Check the shaft (3//Fig. 5 / p. 29) for play and the retaining rings (4//Fig. 5 / p. 29) for firm seating.
- Check the nuts of the two gripping bolts (5//Fig. 5 / p. 29) and tighten, if necessary.
- Check the edges of the locking disks (6//Fig. 6 / p. 29); they must not be worn.
- Check to see whether there is play to all sides without any signs of wear on the stop yoke in the head of the stand (7//Fig. 6 / p. 29).

SIM Stand mounting

- Check that the stand is firmly mounted.

SIM Spring counterbalance

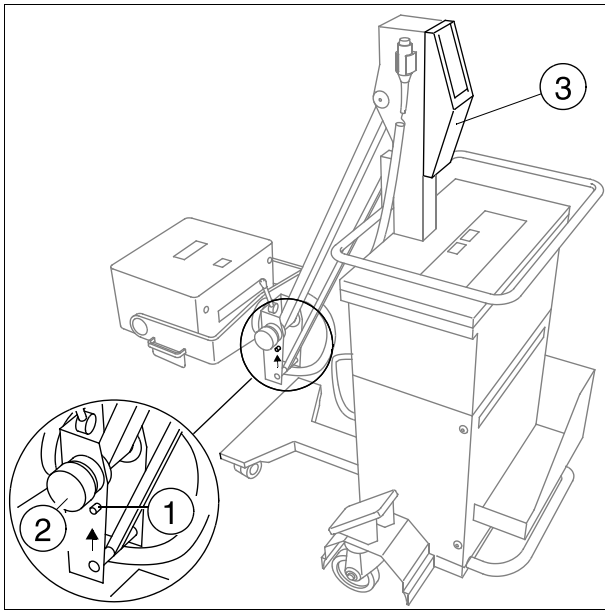


Fig. 7:

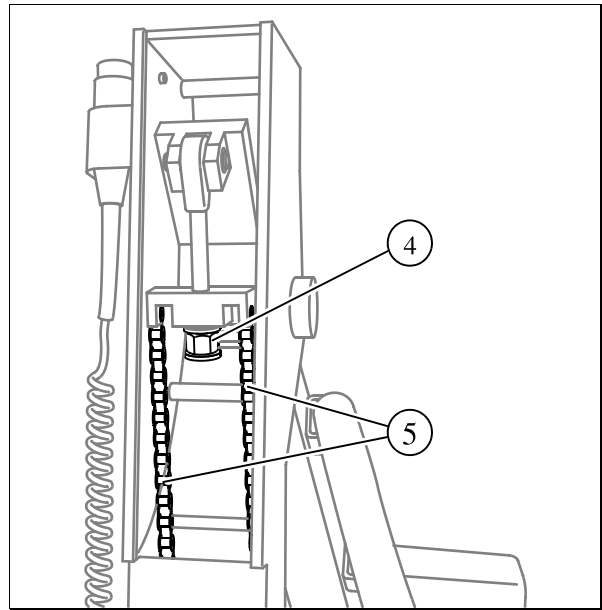


Fig. 8:

- Release the support arm from the (transport) park position (1//Fig. 7 / p. 30)
- Slowly move the support arm into the uppermost position. When doing so, the support arm must stop in any desired position without accessories attached and without the supplementary brake applied (2//Fig. 7 / p. 30).
- Check the additional locking of the support arm with the knob (2//Fig. 7 / p. 30)

Readjusting the spring tension:

- Remove the cover (3//Fig. 7 / p. 30) from the stand.
- Fully release the supplementary brake on the support arm (2//Fig. 7 / p. 30).
- Move the support arm into the horizontal position.
- Firmly tighten the nut (4//Fig. 8 / p. 30) using a 17-mm open-ended wrench. Adjust the spring tension so that the support arm is balanced in the horizontal position, i.e., so that equal force is required when lifting and lowering the tube.

SIM Chains of the spring counterbalance

- Remove the cover (3//Fig. 7 / p. 30) from the stand.
- The condition of the chains (5//Fig. 8 / p. 30) for the spring counterbalance must be checked carefully. If the chain is defective, the stand column must be replaced.

PMP Maintenance of joints and chains

- Spray the joints of the stands with WD-40.
- Grease the chains with Optimol Longtime PD2 (5//Fig. 8 / p. 30).
- Reinstall the stand cover (3//Fig. 7 / p. 30).

2.9 Radiation

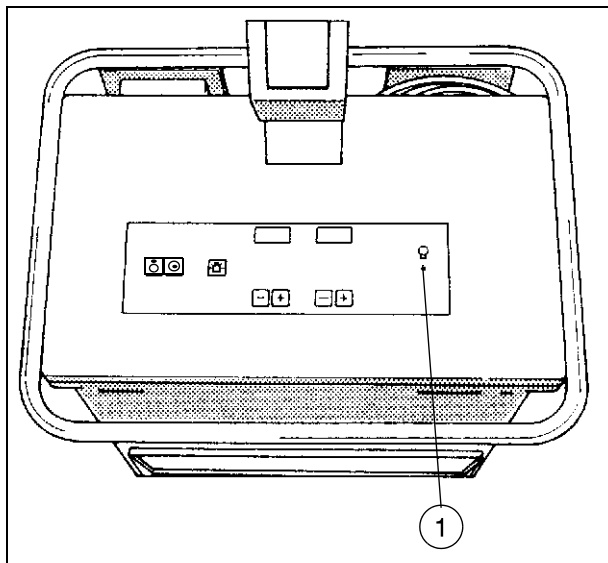


Fig. 9:

- Insert line voltage plug, Polymobil Plus **ON**
- Close the double-slot diaphragm. Set 60 kV, 10 mAs.

SIE Radiation indicator

SIE Acoustic signal



- Release an exposure. The radiation indicator (1//Fig. 9 / p. 31) must light up during the exposure; at the same time, an acoustic signal sounds.
- Switch the Polymobil Plus **OFF** and disconnect the line voltage plug.

PMF kV and tube current (IR)

- Loosen and remove the upper cover of the switchbox by removing the 4 Allen screws.
- Connect oscilloscope:
CH1: D915.IR
CH2: D915.kV (1 V \triangleq 20 kV actual value)
and D915.GND



- Insert line voltage plug, Polymobil Plus **ON**
- Release exposures with 90 kV, 10 mAs.

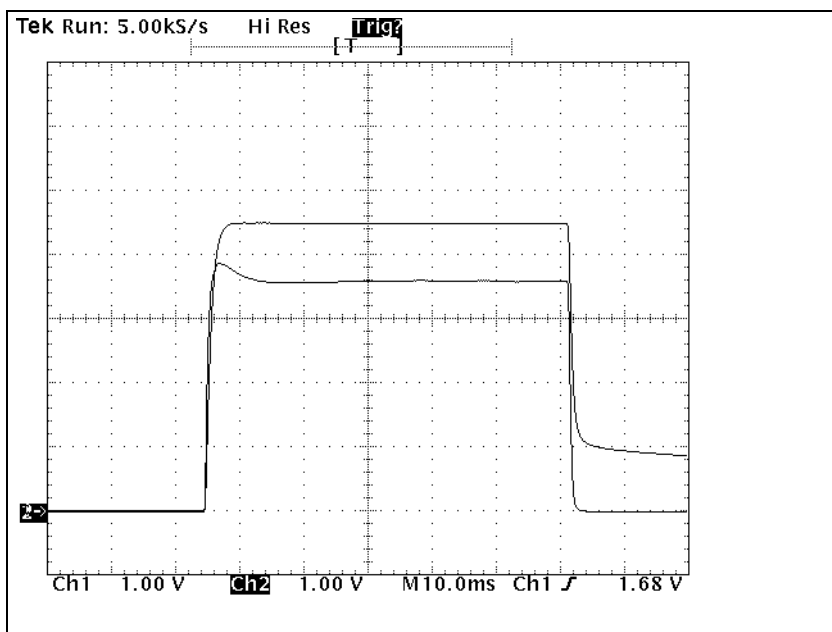


Fig. 10: kV and tube current

- If no oscillogram is produced, adjust as described in the Service Instructions.
- Switch the Polymobil Plus **OFF** and disconnect the line voltage plug.
- Close the control console.

QSQ Coincidence of light field and radiation field

NOTE

If the POLYMOBIL is equipped with a DAP measuring system, remove the DAP ionization chamber first.

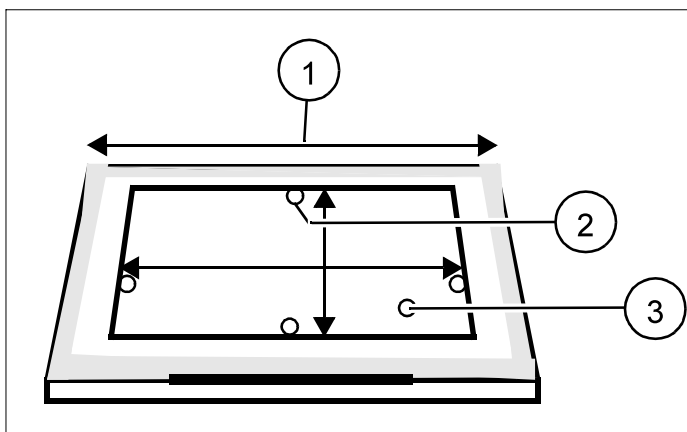


Fig. 11: Preparation: light field and radiation field

- Pos. 1 Length
Pos. 2 Marker
Pos. 3 Side marker



- Insert line voltage plug. Switch Polymobil Plus **ON**.
- Insert a film into the 24 cm x 30 cm or 10" x 12" cassette and place it on a table or similar surface.
- Using a tape measure, set a vertical SID of 100 cm or 40" with respect to the top edge of the cassette.
- Using the control knobs, set a format of 18 cm x 24 cm or 8" x 10".
- Turn on the light localizer and align the cassette.
- Apply radiopaque markers (e.g., washers, coins) on the cassette as shown in the drawing. Use one washer as a side marker.
- Release an exposure (60 kV, 10mAs) and develop the film.
- Note the following data on the developed film using a waterproof felt pen.
 - SID setting
 - Film size
 - Radiation field size

Evaluation:

- Measure the deviations (X1, X2, Y1, Y2) between the light field edges and the radiation field edges on all four sides as shown in the figure below.
- Calculate the total deviations in the X and Y directions (disregarding the algebraic sign).

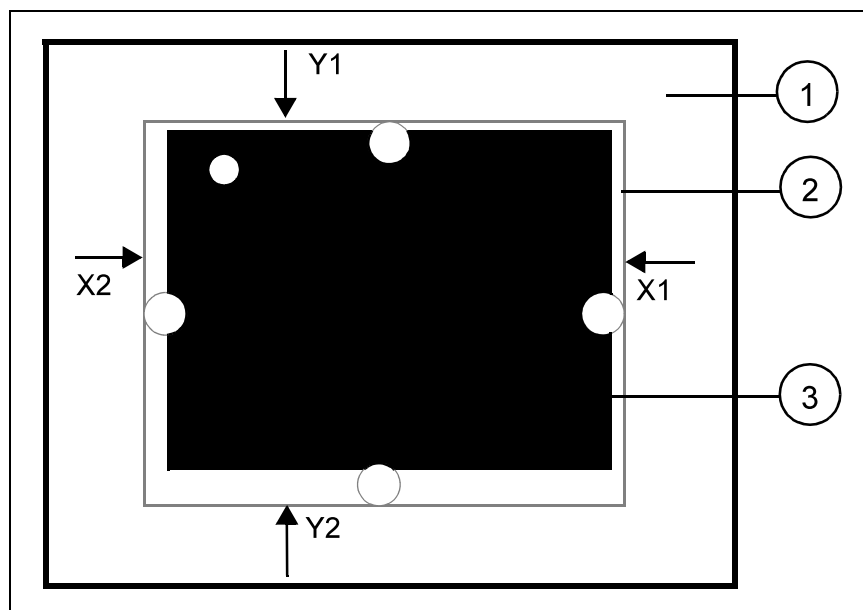


Fig. 12: Evaluation of the light field and radiation field

- Pos. 1 Film
 Pos. 2 Light field
 Pos. 3 Radiation field

- The longitudinal deviation (ΣY) and the width deviation (ΣX) must be less than 1.6 cm respectively.

NOTE

If the deviation exceeds 1.6 cm, please refer to the Service Instructions, chapter "Coincidence of light field and radiation field".

2.10 Control console

SIE Operating elements

SIE Indicators

- Check the operating elements and indicators on the control console
 - Refer to the Operating Instructions "Overview of operating elements".
- Switch the Polymobil Plus **OFF** and disconnect the line voltage plug.

2.11 Protective conductor test

SIE Protective conductor test

Observe the information on the protective conductor resistance test contained in these instructions.

- The protective conductor test is to be carried out according to ARTD-002.731.17... with the unit closed.
The protective conductor resistance must not exceed 0.2 Ohm.
- The determined values are to be logged and evaluated in the report "Protective conductor resistance / report" by indicating the measuring points.
- In addition, the measuring method and the measuring device used (designation and serial number) are to be documented.

NOTE

The report "Protective conductor resistance / report" is filed in the "Certificates" register in the system folder.

NOTE

If documentation of protective conductor resistance measurements is missing, a new report must be created.

A new report "Protective conductor resistance / report" is included in the SPR8-125.034.02.02 startup instructions. Detach this report from these instructions, complete it and file it in the "Certificates" register in the system folder. For a first determination, the determined values are to be logged as values measured for the first time. Evaluation is not required in this case.

2.12 Device leakage current measurement

SIE Device leakage current measurement

Observe the information on the device leakage current measurement contained in these instructions.

- The device leakage current measurement is to be carried out according to ARTD-002.731.17... with the unit closed.

For this, the measuring method indicated in the report is to be used. If the value first measured needs to be determined again, either direct measurement or differential measurement can be selected.

The limit value of 2.5 mA must not be exceeded.

- The measuring method (differential measurement or direct measurement) and the measuring device used (designation and serial number) are to be documented.
- The actual mains voltage is to be measured and logged. If the measured mains voltage deviates from the nominal voltage, the measuring value is to be corrected to the value which corresponds to a measurement with the nominal value of the mains voltage. This is to be additionally documented.
- The highest value is to be entered into the report "Device leakage current / report" and evaluated.

NOTE

The report "Device leakage current / report" is filed in the "Certificates" register in the system folder.

NOTE

If documentation of device leakage current measurements is missing, a new report must be created.

A new report "Device leakage current / report" is included in the SPR8-125.034.02.02 startup instructions. Detach this report from these instructions, complete it and file it in the "Certificates" register in the system folder. For a first determination, the determined values are to be logged as values measured for the first time. Evaluation is not required in this case.

2.13 DAP measuring system (optional)

- Press the test button on the display. The value on the display should be in the range 80-120 μGym^2 (DAP resolution 0.1 μGym^2) or 8-12 μGym^2 (when using a chamber of high sensitivity, i.e., DAP resolution 0.01 μGym^2). If not, calibrate the system according to the Service Instructions. (when using a chamber of high sensitivity, i.e., DAP resolution 0.01 μGym^2). If not, calibrate the system according to the Service Instructions.
- Check the function of the DAP measuring system by releasing an exposure. Check if a measured value is shown on the display.

**SIE****Function of DAP measuring system**

2.14 Final Work Steps

PMP Cleaning

Switch the Polymobil Plus off and disconnect it from the line voltage prior to cleaning.

Wipe down the Polymobil Plus with a damp cloth or cotton wadding. Use water or a luke-warm solution consisting of water and a household cleaner to dampen the cloth.

Do not use abrasive cleaners or (due to possible material incompatibility) any organic cleaners or cleaning agents containing organic substances (e.g., benzene, alcohol, spot remover).

Do not spray-wash the Polymobil Plus. Cleaning fluids must NOT be allowed to seep into the Polymobil Plus.

3 Changes to the previous version

Chapter	Paragraph	Change
All	n.a.	Document changed to DMS and editorially
General	Required documentation	“Technical Safety Checks - Protocol” added
General	Information on the protective conductor resistance test	New paragraph inserted
General	Information on the device leakage current measurement	New paragraph inserted
General	Technical Safety Checks (TSC)	New paragraph inserted
Inspection and maintenance	n.a.	Different tests categorized as “safety-relevant”, i.e., the corresponding check points changed to SIE or SIM
Inspection and maintenance	Visual inspection - Labels	New paragraph inserted
Inspection and maintenance	Visual inspection - Customer documents	New paragraph inserted
Inspection and maintenance	Protective conductor test	Revised completely
Inspection and maintenance	Device leakage current measurement	Revised completely